

Update on the WWRP/WCRP S2S Project and linkages with MAPP S2S Task Force

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NOAA MAPP S2S Prediction Webinar, Feb 21, 2018

S2S Project Status

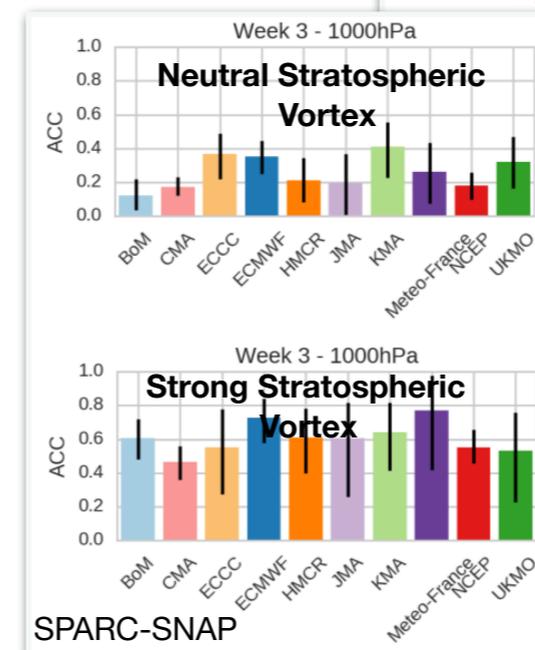
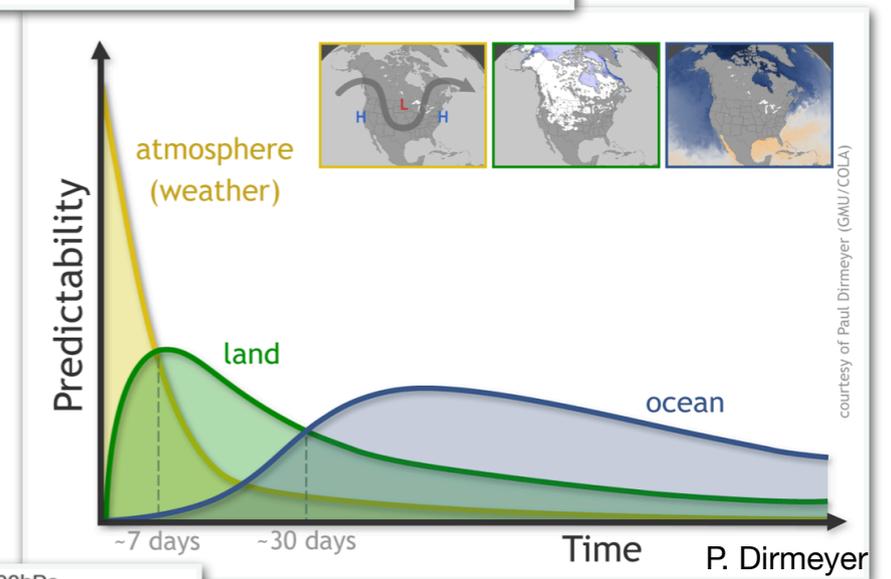
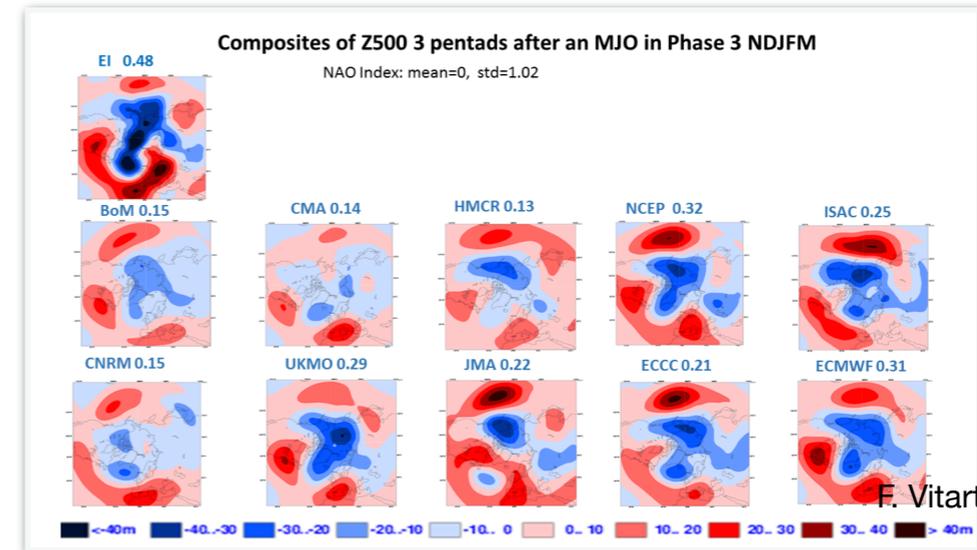
A proposal has been submitted for a 5-year extension 2018-2023 (S2S Phase 2) for approval by the WMO EC in June 2018. Already approved by WWRP SC and WWRP JSC.

Phase 2 plans:

1. S2S Database enhancement – ocean variables, more surface variables 4xdaily, additional models (IMD)
2. New research foci (sub-projects) – MJO prediction and teleconnections; Ocean and sea ice initialization and configuration; Land Initialization and configuration; Atmospheric composition; Ensemble generation; Stratosphere
3. Enhancing operational infrastructure, user Applications & real-time pilot

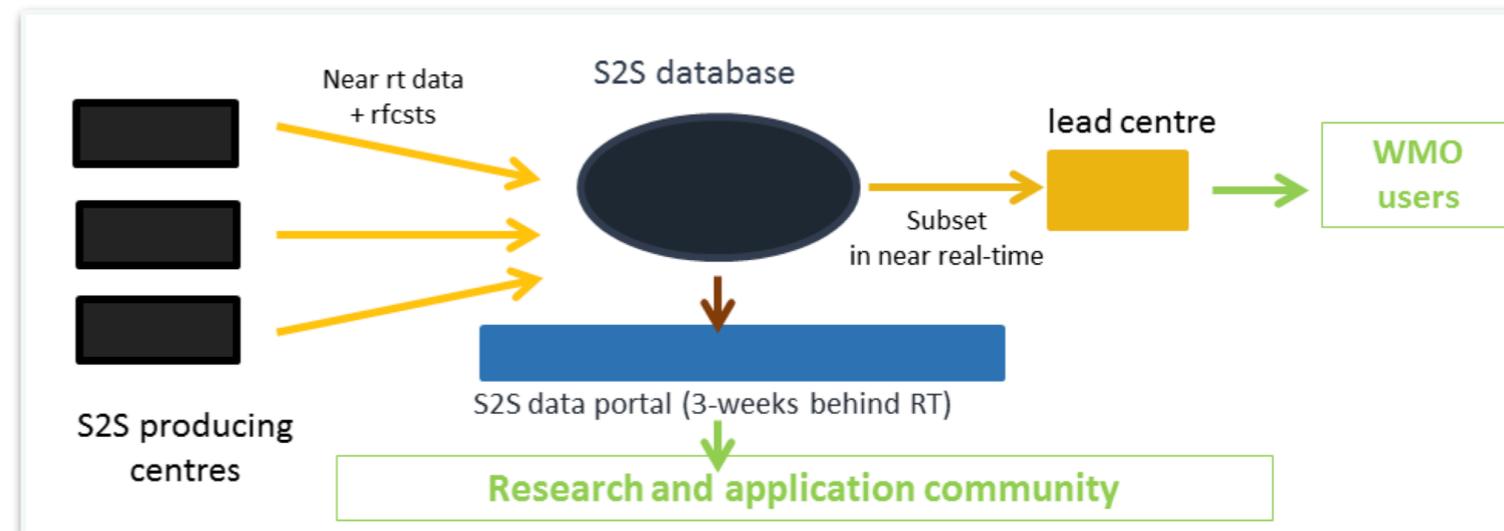
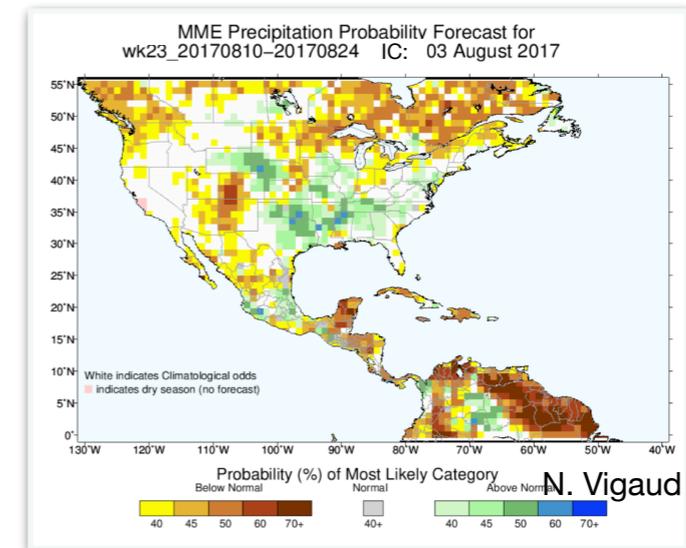
New S2S research foci

- **MJO prediction and Teleconnections:** MJO impacts on high impact weather in the tropics/subtropics and potential for S2S skill; MJO tropical-extratropical teleconnections and extratropical predictive skill
- **Land Initialization and Configuration:** impact of the observing system on land initialization and S2S forecasts; representation of coupled land/atmosphere processes in S2S models; contribution of land surface states to extremes
- **Ocean and Sea Ice Initialization and Configuration:** role of ocean-atmosphere coupling in S2S variability & S2S model representation; current capabilities of S2S sea ice process simulation, prediction, and sensitivity to initial state; predictability of sub-seasonal marine variability (eg relevant to fisheries & coral bleaching)
- **Ensemble Generation:** impact of burst and lagged ensemble & relative importance of random and systematic errors on forecast spread; potential benefits of stochastic parameterization; benchmark of spread-error relationship
- **Atmospheric Composition:** impact of prognostic aerosols on S2S forecasts; level of complexity needed; predictability of aerosols (e.g. dust) & potential forecast value for applications
- **Stratosphere:** role of vertical coupling, stratospheric systematic errors, and impact of quality of stratospheric initial conditions



Enhancing operational infrastructure, user applications & real-time pilot

- Promote the development and inter-comparison of different methodologies for forecast calibration, multi-model combination, verification, and forecast formats (e.g. probability of threshold exceedance)
- Make recommendations for operational centres to harmonize their real-time and re-forecast set-ups
- Work with IPET-OPSLs to (a) develop standards to define criteria for the designation of Global Producing Centers for S2S Predictions, and (b) establish standards for data exchange and delivery of S2S hindcasts and real-time forecasts to the WMO LC-LRFMME
- Establish a real-time forecast pilot program for S2S applications of 1–2 years duration, in which S2S data would be made available in real time (w/o 3 week lag) to a set of projects/ stakeholders, with the goal of demonstrating S2S forecast value



MAPP S2S-TF Projects

| Group Name | Progress Update Slides | MJO & Tropics | Extratropical Dynamics & Extremes | Surface-Atmosphere Interactions | Modeling, Predictability, Skill, & Products | Stratosphere |
|---|--|--|--|--|---|---|
| Barnes & Maloney | (.pdf) (.pptx) | MJO | Blocking / Atmospheric Rivers | | | |
| Camargo, Sobel, Lee, & Vitart | (.pdf) (.pptx) | MJO / Tropical Cyclones | | ENSO | | |
| Chang, M. Zhang, Kim, & W. Wang | (.pdf) (.pptx) | MJO | Extratropical Cyclones / Extremes | | | |
| Delsole, Kirtman, & Pegion | (.pdf) (.pptx) | | | | NMME / Subseasonal Predictability / Subseasonal Prediction Skill | |
| DeMott & Klingaman | (.pdf) (.pptx) | MJO | | Ocean Feedbacks | Oceanic Sources of Predictability | |
| Ford & Dirmeyer | (.pdf) (.pptx) | | Heat Waves | Land-Atmosphere Interactions / Land Surface Memory | Forecast Skill | |
| Furtado, Allgood, L'Heureux, & Barnes | | MJO-Polar Jet Stream Interactions | Extreme Weather | | | Troposphere-Stratosphere Coupling |
| Guo & Dirmeyer | (.pdf) (.pptx) ^Δ | | | Land Surface | Multi-Model Combination Strategy / Subseasonal-to-Seasonal Forecast Skill | |
| Hoover, Newman, Vimont, & Morgan | | | Blocking / Dynamics | | LIM (Linear Inverse Model) | |
| Kumar, W. Wang, & Zhu | (.pdf) (.pptx) | MJO / Convection | | Air-Sea Coupling | Prediction & Predictability / Model Resolution | |
| Lang | (.pdf) (.pptx) | | Wave Activity Flux / Blocking | | Forecast Skill | Troposphere-Stratosphere Coupling / Stratosphere Polar Vortex |
| Muñoz, Robertson, Vecchi | | | Extremes, Weather Types | | Sources of Predictability / Verification / Model Diagnostics / Cross-Timescale interference | Impact of stratosphere nudging on circulation patterns |
| Perlwitz, Richter, Sun, Bacmeister, & Tribbia | (.pdf) (.pptx) | | NAO Extremes | ENSO-NAO Connection | | Stratospheric Pathway |
| Szunyogh, Chang, & Saravanan | (.pdf) (.pptx) | | Mid-latitude Storm Tracks | Ocean Mesoscale Eddy-Atmosphere (OME-A) Feedback / Mesoscale SST Variability | | |
| S. Wang, Sobel, & Tippett | (.pdf) (.pptx) | MJO / Maritime Continent Barrier | | | S2S Model Seamless Verification | |
| Wood, Rajagopalan, P. Peng, & Y. Zhang | (.pdf) (.pptx) | | | | S2S Applications / Climate Products for the Water Sector | |
| Z. Wang, M. Peng, & Benjamin | (.pdf) (.pptx) | Tropical Cyclones / Tropical-Extratropical Interaction | Rossby Wave Breaking / Extreme Weather | | | |
| SubX | (Slide 1.pdf) (Slide 1.pptx) (Slide 2.pdf) (Slide 2.pptx) | | | | | |

S2S and SubX databases in IRI Data Library

IRI Data Library
ECMWF S2S

Language: english

Description Expert Mode

served from [IRI/LDEO Climate Data Library](#)

SOURCES ECMWF S2S

ECMWF S2S

ECMWF S2S: WWRP/WCRP Sub-seasonal to Seasonal Prediction Project.

Documents

[overview](#) an outline showing sub-datasets of this dataset

[BAMS paper](#) The Subseasonal to Seasonal (S2S) Prediction Project Database

[ECMWF](#) ECMWF S2S Wiki Page

[Model Table](#) S2S Model Description Table at ECMWF S2S Wiki Page

[README](#) Please see these notes for explanation on accessing and using the S2S Database in the IRI Data Library

[S2S Project](#) WWRP/WCRP S2S Project Page

[Wiki](#) IRI Wiki Page with IRIDL S2S data examples

Datasets and Variables

[BOM](#) BoM POAMA Ensemble.

[CMA](#) Beijing Climate Center (BCC) Climate Prediction System version 1 for S2S.

[CNRM](#) CNRM Ensemble Prediction System.

[ECCC](#) ECCC Ensemble Prediction System.

[ECMF](#) ECMWF Ensemble.

[EI](#) Era Interim Reanalysis.

[HMCR](#) HMCR Ensemble.

[ISAC](#) ISAC-CNR Ensemble.

[JMA](#) JMA Ensemble System.

[KMA](#) KMA Seasonal Prediction System.

[NCEP](#) NCEP CFSv2 Ensemble.

[UKMO](#) UKMO Ensemble Prediction System.

IRI Data Library
Models SubX

Description Expert Mode

SOURCES Models SubX

Models SubX

Models SubX: Subseasonal Experiment (SubX).

Documents

[overview](#) an outline showing sub-datasets of this dataset

[CTB](#) NOAA Climate Test Bed Website

[DataCite DOI Metadata](#) DOI:10.7916/D8PG249H

[SubX Data Information](#) Model/Data Information from SubX Project Website

[SubX Project](#) SubX Project Website

Datasets and Variables

[CESM](#) Models SubX CESM[30LCESM1 46LCESM1]

[ECCC](#) Models SubX ECCC[GEM]

[EMC](#) Models SubX EMC[GEFS]

[ESRL](#) Models SubX ESRL[FIMr1p1]

[GMAO](#) Models SubX GMAO[GEOS_V2p1]

[NCEP](#) Models SubX NCEP[CFSv2]

[NRL](#) Models SubX NRL[NESM]

[RSMAS](#) Models SubX RSMAS[CCSM4]

Other Info

id

<https://doi.org/10.7916/D8PG249H>

Main points

- S2S Phase 1 was significantly strengthened by MAPP-funded S2S research which is the largest regional activity (S2S Project can't fund research)
- Opportunities for S2S to leverage MAPP-funded research in Phase 2, which will start Nov 2018
- SubX and S2S databases are both available in IRI Data Library, facilitating their use in conjunction
- Real-time SubX could be useful to S2S applications research and contribute to the proposed S2S real time pilot